

## PUNNETT SQUARES

An Englishman named Punnett figured out an easy way to predict the possible appearance of certain hereditary traits. He used a checkerboard square. On one side he put the genes carried in the egg, and along the top he put the genes carried in the sperm or the pollen of plants. The Punnett squares below will predict the results of some of Mendel's crosses with pea plants. Capital letters indicate genes of dominant traits and small letters indicate the recessive traits.

Use the Punnett squares to predict the results of various crosses between tall and short pea plants. Then fill in the phenotype and genotype of each cross. The first square which corresponds to Mendel's first cross between tall and short plants has been done for you.

**TT X tt**

	t	t	Sperm
T	Tt	Tt	
T	Tt	Tt	

Egg

Genotype:	Phenotype:
<u>0%</u> TT	<u>100%</u> tall
<u>100%</u> Tt	<u>0%</u> short
<u>0%</u> tt	

**Tt X Tt**

	T	t
T		
t		

Genotype:	Phenotype:
<u>    </u> % TT	<u>    </u> % tall
<u>    </u> % Tt	<u>    </u> % short
<u>    </u> % tt	

**Tt X tt**

	t	t
T		
t		

Genotype:	Phenotype:
<u>    </u> % TT	<u>    </u> % tall
<u>    </u> % Tt	<u>    </u> % short
<u>    </u> % tt	

**Tt X TT**

	T	T
T		
t		

Genotype:	Phenotype:
<u>    </u> % TT	<u>    </u> % tall
<u>    </u> % Tt	<u>    </u> % short
<u>    </u> % tt	

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In addition to tallness, Mendel crossed pea plants for six other characteristics. He found that yellow (Y) seeds were dominant over green (y), and that round (R) seeds were dominant over wrinkled (r). Use the Punnett squares below to predict the results of the following crosses. Label the squares and give the genotype and phenotype percentages in the provided spaces.

YY X yy


Genotype: \_\_\_\_\_ % YY  
 \_\_\_\_\_ % yy  
 \_\_\_\_\_ % Yy

Phenotype: \_\_\_\_\_ % yellow  
 \_\_\_\_\_ % green

RR X rr


Genotype: \_\_\_\_\_ % RR  
 \_\_\_\_\_ % rr  
 \_\_\_\_\_ % Rr

Phenotype: \_\_\_\_\_ % round  
 \_\_\_\_\_ % wrinkled

Yy X Yy


Genotype: \_\_\_\_\_ % YY  
 \_\_\_\_\_ % yy  
 \_\_\_\_\_ % Yy

Phenotype: \_\_\_\_\_ % yellow  
 \_\_\_\_\_ % green

Rr X Rr


Genotype: \_\_\_\_\_ % RR  
 \_\_\_\_\_ % rr  
 \_\_\_\_\_ % Rr

Phenotype: \_\_\_\_\_ % round  
 \_\_\_\_\_ % wrinkled

### CHALLENGE:

Draw two other Punnett squares with other possible gene combinations for yellow and green seeds or wrinkled and round seeds.